STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. _____

Petition of twenty Vermont utilities and	)
Vermont Public Power Supply Authority	)
requesting authorization pursuant to 30	)
V.S.A. § 248 for the purchase of shares of	)
218 MW to 225 MW of electricity from H.Q.	)
Energy Services (U.S.) Inc. commencing	)
November 1, 2012 through 2038, issuance of	)
findings that such purchases are entitled to	)
rate recovery assurance, and requesting	)
certain approvals under 30 V.S.A. § 108	)

JOINT PREFILED TESTIMONY OF WILLIAM J. DEEHAN AND CHRISTOPHER COLE ON BEHALF OF PETITIONERS

August 17, 2010

In their joint testimony, witnesses Deehan and Cole (i) describe the power supply gap facing Vermont, (ii) explain that the PPA will replace a portion of Vermont's current power purchases from Hydro-Québec, (iii) describe the major provisions of PPA and related transaction documents, (iv) address a number of the Section 248(b) criteria on a statewide basis, specifically, Section 248(b)(2)(need), Sections 248(b)(4) and 248(a) (economic benefit and general good), Sections 248(b)(3) and (b)(10)(impact on reliability, stability and transmission), and Section 248(b)(7) (state energy plan), and (v) support the request for issuance of the findings that the PPA will promote the general good and that the power purchase costs associated therewith should be entitled to rate recovery assurance.

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JOINT PREFILED TESTIMONY OF
WILLIAM J. DEEHAN AND CHRISTOPHER COLE
ON BEHALF OF
PETITIONERS

1. Introduction

Q1. Please state your name, occupation and business address.

A1. William Deehan:

My name is William J. Deehan. I am Vice President of Power Planning and Regulatory Analysis for Central Vermont Public Service Corporation ("Central Vermont" or "CVPS").

Christopher Cole:

My name is Christopher Cole. I am Resource Planning Analyst for Green Mountain Power Corporation ("Green Mountain Power" or "GMP").

Q2. Please summarize your education, training and professional experience.

A2. William Deehan:

My qualifications are set forth in my resume, attached as Exhibit Petitioners' Joint -1.

Christopher Cole:

My qualifications are set forth in my resume, attached as Exhibit Petitioners' Joint-2.

Q3. What is the purpose of your testimony?

A3. Our testimony (i) describes the expected power supply shortfall facing Vermont, (ii) describes the proposed long-term Power Purchase and Sale Agreement ("PPA") dated as of August 10, 2010 among H.Q. Energy Services U.S. Inc. ("HQUS" or "Seller"), Central Vermont Public Service Corporation ("CVPS"), Green Mountain Power Corporation ("GMP"), Vermont Electric Cooperative, Inc. ("VEC"), Vermont Public Power Supply Authority, a body politic and corporate and a public instrumentality of the State of Vermont exercising public and essential governmental functions ("VPPSA"), Vermont Marble Power Division of Omya Inc. ("Vermont Marble"), City of Burlington, Vermont Electric Department ("BED"), and the Town of Stowe Electric Department ("Stowe") (each of CVPS, GMP, VEC, VPPSA, Vermont Marble, BED and Stowe are also referred to as a "Buyer," and collectively, the "Buyers"), (iii) explains that the PPA will replace

approximately two-thirds of Vermont's current power purchases from Hydro-Québec, (iv) describes the collateral agreements, and a Hydro-Québec guaranty and allocation agreement associated with the PPA, (v) addresses a number of the Section 248(b) criteria on a statewide basis, specifically, Section 248(b)(2)(need), Sections 248(b)(4) and 248(a) (economic benefit and general good), Sections 248(b)(3) and (b)(10)(impact on reliability, stability and transmission), and Section 248(b)(7)(state energy plan), and (vi) supports the Petitioners' request for issuance of the findings that the PPA and associated agreements will promote the general good and that the power purchase costs of the contract be entitled to rate recovery assurance.

Q4. Who are the other witnesses and how do their testimonies interrelate with yours?

A4. In addition our joint testimony, each of the Buyers who are Petitioners to this proceeding has filed testimony for its respective organization, addressing Section 248(b)(2)(need), Sections 248(b)(4)(economic benefit), and Section 248(b)(7)(IRP). These witnesses are William Deehan, James Cater and Charles Watts on behalf of CVPS, Douglas Smith on behalf of GMP, Craig Kieny on behalf of VEC and Stowe, Brian Callnan on behalf of VPPSA, Todd Allard on behalf of Vermont Marble, Patricia Richards on behalf of Washington Electric Cooperative ("WEC"), and Kenneth Nolan on behalf of BED. Our testimony provides the general context while their testimonies address more specifically

the need and economic evaluation of each Buyer's purchase in the context of each Buyer's circumstances.

In addition, as to VPPSA, Mr. Callnan's testimony also describes the Power Sales Agreements ("VPPSA PSAs") between VPPSA, its thirteen member municipalities (the "VPPSA Municipalities") and WEC.

Q5. Please summarize your conclusions and recommendations.

A5. The proposed PPA is an opportunity for Vermont to purchase a very significant and long-term quantity of power that: (i) is needed to meet an expected power supply gap facing the Buyers; (ii) is based upon a very high renewable content; (iii) provides significant price stability with a significant price-hedge against spot market volatility; (iv) is a relatively low-cost source of power, with an expected cost roughly equivalent to the cost of non-renewable market sources of power, (v) is highly reliable, because energy will be supplied during the peak sixteen hours every day of the contract term and is not contingent upon any generator or interconnection facility; (vi) is backed by a provider with very high quality credit; and (vii) is supplied under a PPA that contains performance assurance provisions that are manageable for Vermont's utility buyers – particularly should the Board find that rate recovery assurance is warranted in this proceeding.

Moreover, the evidence developed by the witnesses shows that the PPA is a prudent hedge against price volatility and that it is likely to represent savings against the cost of other sources – particularly other sources of renewable, low-emission power. This contract is a quite a unique resource opportunity for Vermont. The PPA is consistent with Vermont state policy and law that encourages clean, affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuation for Vermonters.

We recommend that the Board approve the purchases under the PPA and determine that the cost of the contract will be recoverable in rates subject to ongoing prudent management.

2. The Power Supply Gap

Q6. Please summarize Vermont's current power supply situation aggregated for all of the Buyers.

A6. The actual supply/demand balance faced by each Buyer is detailed in each Buyers' individual testimony.

Vermont is facing the impending loss of two large power contracts – the existing Hydro-Québec Vermont Joint Owners Firm Power and Energy Contract (the "VJO Contract") and the Power Purchase Agreement for power from the Vermont Yankee Nuclear Power

Station (the "Vermont Yankee Contract"). Those sources supply in aggregate at least 590 MWs, or roughly two-thirds of Vermont's power needs. The Vermont Yankee Contract is due to expire in 2012, and a large portion of the VJO Contract deliveries terminate between 2012 and 2015, with the last schedule expiring by 2020. The loss of these two significant power supply resources creates the potential for a significant power supply gap. The actual supply/demand balance faced by each Buyer is detailed in each Buyer's separate prefiled testimony and exhibits.

Q7. Does the loss of the Vermont Yankee and VJO Contracts place Vermont at risk for electricity supply?

A7. Not in a physical sense, but the fact that they are coming to term does represent an economic exposure for consumers. Vermont utilities purchase and sell their electricity in the ISO New England, Inc. ("ISO-NE") regional power market. Because the ISO-NE market design includes market mechanisms and accountability to ensure regional resource adequacy, the expiration of these contracts does not mean that Vermont will physically lose electric supply. However, the loss of these important portfolio resources presents challenges in finding replacement supplies for Vermont that are reliable,[1] stably priced, affordable and equally low in carbon emissions to resources in our existing power supply portfolio.

1 While there are physical implications in the event that either the Highgate facility or Vermont Yankee were to cease to operate, the fact that contracts associated with them are ending does not directly affect reliability.

3. The New England Wholesale Electricity Markets

Q8. Before you describe the PPA, it would be helpful if you would provide an overview of how electricity is transacted in the New England wholesale energy markets.

A8. Certainly. It is important to have that background because this PPA has been constructed using contemporary tools created specifically for our regional power market. ISO-NE, established in 1997 and designated as a Regional Transmission Organization ("RTO") in 2005, plans for and operates the New England power grid and administers and oversees competitive wholesale markets for buying and selling electricity within the ISO-NE's six-state New England region. Power markets have changed dramatically as a result of the Federal Energy Regulatory Commission ("FERC")'s policy initiatives including Open Access Transmission and Standard Market Design, under which the FERC has required that transmission services be unbundled from the power supply function, made transmission service available on a nondiscriminatory basis, and established a comprehensive framework for competitive wholesale electricity markets. Collectively these changes and the manner in which they have been applied in New England have added tremendous transparency to the energy and capacity markets. This is a very different situation from that which existed in 1987 when the VJO Contract was negotiated.

Q9. How is energy priced and transacted in the ISO-NE energy market?

A9. The ISO-NE energy market consists of hourly "day-ahead" and "real-time" markets for electricity, each having its own hourly settlement to measure charges for energy demand and payments to supply. The day-ahead energy market occurs the day before the operating day and is defined by participant estimated supply offers and demand bids for energy. From these offers and bids, ISO-NE identifies the lowest marginal market-clearing price required at each location, or node, for every hour to balance demand with supply.

The quantities and prices that clear in the day-ahead market are financially, not physically, binding. During the operating day or real time market, ISO-NE compares these predicted day-ahead volumes with actual supply and demand and re-establishes a new hourly price depending on the need for more or less expensive supply to physically balance the market. If a participant does not match its commitments from the day-ahead market with actual supply or load during real-time, this difference is charged the real-time settlement price.

ISO-NE has afforded participants with a number of methods to allow participants that enter into transactions with one another the ability to have these side arrangements reflected in their ISO-NE settlement. Most commonly, this is achieved using bilateral contracts that mimic load or supply at any of the various settlement nodes within the ISO

settlement. These contracts, called Internal Bilateral Transactions ("IBT"), allow Vermont Buyers, or any load serving entity, to offset the settlement of their day-ahead or real time load at market clearing prices with supplies which settle in the same hours and in the same manner. After this offsetting occurs in the market system, a participant is effectively left with a price for the obligation that reflects the separate agreement between the parties.

The PPA's energy product is transacted via this IBT mechanism and will result in a portion of the Buyers' load obligations equal to their quantities of energy purchased under the PPA to be effectively hedged at the PPA price.

Q10. Please describe HQUS, the Seller, and its role in the ISO-NE markets.

A10. HQUS is the U.S. power marketing subsidiary of Hydro-Québec and is charged primarily with delivering Hydro Quebec Production ("HQP")'s exported energy into neighboring U.S. markets. HQUS holds an authorization from the U.S. Federal Energy Regulatory Commission to sell at market-based rates and is a registered participant in all of the northeastern U.S. market regions. In New England, this activity includes reserving transmission and scheduling imports across the three primary interconnections between the region and Canada (Highgate, Phase 2, and New Brunswick).

4. Description of the PPA

4.1. Overview of the PPA and Associated Agreements

Q11. Please provide an overview of the PPA.

A11. The PPA is a long-term, twenty-six year power contract for the purchase of up to 218 to 225 MW of energy and the associated volume of HQP system environmental attributes starting in November 2012 and continuing through 2038. The PPA is included with our testimony as Confidential Exhibit Petitioners' Joint-3 (redacted in part).

The PPA will provide Vermont with environmental attributes of power of which 90% or more will be based on renewable hydro resources, and therefore will feature very low air emissions. In contrast, the New England power mix is based on predominantly fossil fuel generation. In particular natural gas-fired power plants tend to be among the last plants (the marginal units) dispatched to serve typical daily loads in New England. This almost exclusive reliance on gas-fired generation at the margin in New England has raised concerns about price volatility, greenhouse gas ("GHG") emissions, and the potential for fuel-supply disruptions and thus lower system reliability.[2]

The PPA will provide clean, low emissions energy with relative price stability at competitive prices relative to other potential power supply resources. Given current forward market conditions, the PPA price is now projected to start at approximately

2 2005 Vermont Electric Plan, at 7-19.

$60/MWh in November of 2012. Thereafter it is adjusted annually by a formula influenced by market conditions and inflation and subject to a limit on single year price changes. We expect that these ongoing adjustments will tend to keep the contract price closely associated with market prices during periods of moderate volatility while significantly limiting Vermont's exposure to rapid or sustained high price periods. In general, this type of protection can only be obtained from resources (like renewables) that are not directly exposed to high fossil fuel input costs. However, unlike most of the other opportunities that we have encountered to add renewable resources to our portfolios, and in particular new, premium or local renewable resources, this PPA has a significant price advantage and is comparable in cost to what we would expect from more conventional sources of power. We describe the PPA's pricing provisions in more detail in Section 4.5 of our testimony, below.

The PPA includes six schedules of energy quantities over the term (Appendix 3.2(c)(i) & (ii)), totaling in aggregate up to 218 to 225 MW per hour, sixteen hours a day (the key "peak load" hours), seven days a week, every day of the year for every year of the contract. The contract volume phases-in during the first eight years as the volumes purchased under the existing VJO Contract phase down. Volume also is reduced during the last three years of the agreement in order to facilitate a future transition. We describe the PPA volumes under Section 4.2 of our testimony, below.

The PPA provides the most firm type of energy supply available to buyers. Unlike the energy purchased under the existing VJO Contract with HQ, which we must successfully schedule each day across the physical ties that make up the interface with Québec, the availability of energy under the PPA is effectively 100% during the sixteen on-peak hours. This is because HQUS has accepted the contractual obligation to schedule the energy irrespective of the availability of the ties, *via* the IBT market mechanism, and the Buyers need only to confirm this transfer in order to receive the full economic value of the contract.

Q12. Does the PPA include the sale and purchase of capacity?

A12. No. This PPA does not include capacity. Due to ISO-NE market rules relating to capacity and calculation of tie benefits, capacity over NE-CAN interties is not available as a firm, long-term product at this time.

Q13. Please describe the other agreements among the Seller and the Buyers that are attached to your testimony and the contractual relationship between the Buyers.

A13. In addition to the PPA, there are three other agreements that are integral to this transaction. First, each Buyer has executed an individual Collateral Agreement ("CA") with HQUS in the form included with our testimony as Confidential Exhibit Petitioners'

Joint-4 (redacted in part). Second, Confidential Exhibit Petitioners' Joint-5 (redacted in part) is a Guaranty from Hydro-Québec ("GA") in favor of each Vermont Buyer which has been apportioned under an Allocation Agreement among Vermont Buyers (Confidential Exhibit Petitioners' Joint-6 (redacted in part)).

Although the PPA is a single stand-alone power contract, the obligations of the Buyers are not joint, they are several. *See* Section 11.8 of the PPA. The intent and structure is that each Buyer's participation in and obligations under the PPA will be stand-alone. As such, the PPA, the CA and the GA are constructed such that the obligations of each Buyer and the Seller are separate and distinct and, any future performance issues that could arise between an individual Buyer and the Seller should not affect the others' transactions. These documents are described in more detail later in our testimony.

4.2. The Energy and Environmental Attributes Quantities

Q14. Please explain the extent to which the PPA will replace the Buyers' shares of the existing VJO and Vermont Yankee Contracts.

A14. The PPA will replace in aggregate from 218 to 225 MW of the 310 MW maximum of the expiring VJO Contract power at a slightly lower annual capacity factor (66.7% vs. 75%). The PPA will thus replace approximately 65% of the existing VJO Contract. The status of Vermont Yankee, the other large existing supply that is coming to term, remains very

uncertain as this testimony is being submitted. Relative to the energy represented by both sources, the new PPA will replace only about 30% of the total reduction in energy supply. For individual Buyers, this replacement percentage will of course vary to the degree in which they participate in the existing contracts.

Q15. Please describe the volumes of energy and attributes that will be transferred to Buyers over the term of the PPA.

A15. The PPA includes six schedules for transfer of energy and environmental attribute quantities, with two allocation tables. At the outset, the Energy Quantity was chosen to be equal to the transfer capability at Highgate, which is 218 MW, and therefore 218 MW is the Energy Quantity allocated among the Buyers in Appendix 3.2(c)(i) of the PPA. If Highgate's transfer capability is increased to 225 MW during the term of the PPA, the Energy Quantity will increase to 225 MW and the allocations among the Buyers will increase as shown in Appendix 3.2(c)(ii) and as reproduced in the tables below. Both the U.S. and Québec portions of the Highgate tie are currently under study and the intention of parties is to support investments necessary on each side to reinforce the reliable operation and if feasible increase the Converter to 225 MW in the near future.

Pursuant to Section 3.3 of the PPA, for each calendar year during the term of the PPA, HQUS must also transfer to each Buyer its share of the HQP system mix "Environmental

Attributes" and that mix cannot by agreement be less than 90% hydroelectricity each year over the term. The amounts of the Environmental Attributes are derived from the Energy Quantity and the number of hours of sales in each month. We discuss the Environmental Attributes in more detail in Section 4.4 of our testimony

The following two tables are from the PPA and identify each Vermont Buyer's allocation of Energy over the term of the PPA:

BUYERS' SHARES OF THE ENERGY QUANTITY AT 218 MW

	November 1, 2012 to October 31, 2015	November 1, 2015 to October 31, 2016	November 1, 2016 to October 31, 2020	November 1, 2020 to October 31, 2030	November 1, 2030 to October 31, 2035	November 1, 2035 to October 31, 2038
	MW	**MW**	**MW**	**MW**	**MW**	**MW**
BED	0	5	5	9	9	4
CVPS	0	83.119	94.119	95.119	105.809	22.69
GMP	4.821	65.589	75.063	75.063	79.11	18.342
Stowe	1.032	2.884	2.984	2.984	2.251	0.399
VEC	15.236	15.236	15.236	16.236	4.004	4.004
VPPSA	0.911	11.172	15.598	15.598	16.267	6.006
Vermont Marble	3	4	4	4	1.559	0.559
Total	25	187	212	218	218	56

BUYERS' SHARES OF THE ENERGY QUANTITY AT 225 MW

	November 1, 2012 to October 31, 2015	November 1, 2015 to October 31, 2016	November 1, 2016 to October 31, 2020	November 1, 2020 to October 31, 2030	November 1, 2030 to October 31, 2035	November 1, 2035 to October 31, 2038
	MW	**MW**	**MW**	**MW**	**MW**	**MW**
BED	0	5	5	9	9	4
CVPS	0	85.419	96.419	98.419	112.101	26.682
GMP	7.017	67.485	76.959	76.959	81.293	20.825
Stowe	1.238	2.89	2.99	2.99	2.135	0.483
VEC	17	17	17	17	3.845	3.845
VPPSA	1.745	11.206	15.632	15.632	15.91	6.449
Vermont Marble	5	5	5	5	0.716	0.716
Total	32	194	219	225	225	63

4.3. The Energy Product

Q16. Please explain how the energy will be transacted as an IBT.

A16. As we mentioned earlier, buyers in the ISO-NE wholesale energy market typically meet their power supply needs through demand bids into the day-ahead market and they may hedge that exposure to hourly market pricing through bilateral contracts with a seller. The PPA is a bilateral contract, or more specifically, a contract that utilizes an IBT as the vehicle to effectuate the purchase and sale in the ISO settlement system. An IBT is defined by ISO-NE as a sale and purchase of energy obligations internal to the New England markets under which a market purchaser receives a reduction in its respective day-ahead adjusted load obligations and its real-time adjusted load obligations and the market seller receives a corresponding increase in its day-ahead adjusted load obligation and its real time adjusted load obligation in the amount of the sale, in MW.

Q17. You have stated that physical deliveries into Vermont under the IBT are not required. What method is in place to ensure that scheduled deliveries of energy are made into or within the New England markets to meet the obligation created by the PPA?

A17. In accordance with the PPA and applicable ISO-NE market rules and procedures, HQUS will schedule and each of the Buyers will confirm, an IBT for the quantity of energy each hour called for under the PPA. As a scheduled supplier, HQUS will then have an obligation to ISO-NE under Market Rule 1 to produce the committed quantity during

real-time or pay for the energy not delivered with a purchase of energy from the real-time energy market or another internal bilateral transaction. As a result, unlike the existing VJO Contract, which is based upon the obligation of HQ to deliver the contract energy and capacity to the international border on specific interconnection facilities when scheduled by the VJO and when those facilities in fact operate in real time (and therefore potentially risking deliveries if the interconnecting facilities are not available, as occurred most notably during the 1998 ice storm), the energy purchases under this PPA are not linked to or dependent upon availability of transmission interties or for that matter particular generators. The delivery obligation to back up the scheduled energy resides solely with HQUS under its obligations to the ISO-NE. Unavailability of the HQUS supply or transmission does not excuse its performance under the PPA. This aspect of the PPA – employing this feature of the ISO-NE energy market – significantly reduces performance risk to Vermont consumers relative to the VJO Contract or relative to sources of non-firm power.

4.4. The Environmental Attributes of the Energy

Q18. Please explain how the parties will ensure that the energy volumes Vermont receives under this PPA will be paired with environmental attributes from the HQ system mix.

A18. It is HQUS' obligation to transfer environmental attributes associated with power delivered by HQUS into New England to the Buyers in a quantity matching the Buyers'

energy quantity and provide documentation ("attest") that these attributes have the characteristics of the HQ Production system and in any event meet the 90% minimum hydroelectric content requirement. If for any reason HQUS does not meet this obligation, the Buyers have the remedies described in Article 4.2 and 5.2(a) as their recourse. Article 4.2 provides for replacement in the next calendar year, in kind, or via compensation for substitute characteristics depending on circumstances. Where non-performance rises to the level of a breach (Article 5.1.(l)), Article 5.2(a) provides for specific performance, accelerated payment for termination, suspension of performance or any other remedy at law or equity.

Q19. Does the PPA require HQP to build new hydroelectric facilities in order to meet HQUS' obligations under the PPA?

A19. No – there is nothing in this agreement that will require HQP to build new facilities. According to figures reported in its most recent Strategic Plan, HQP had available approximately 200 TWh of mostly hydroelectric energy to meet annual obligations of approximately 190 TWh, before including any of their new development projects. These long planned development projects are beginning to add to this HQP surplus and are expected to add another 10 TWh of hydroelectric supply by 2014. Therefore, it is probably more accurate to conclude that the PPA and other increased activities by HQUS in the region are the result of this established strategy, not vice versa. Moreover, as we

noted earlier, this PPA represents only about two-thirds of Vermont's existing power supply from Hydro-Quebec, and is therefore only a partial replacement of that resource.

Q20. Sections 3.3(g) and (h) of the PPA refer to revenue sharing of the environmental attributes. Please explain how this will work.

A20. There are two situations that may give rise to sharing of revenue associated with sales of environmental attributes by the parties. First, should HQUS import power over Highgate during hours other than the PPA profile hours (that is, sales other than during on-peak, seven x sixteen hours) and make sales of environmental attributes associated with those imports, it must share such attribute revenue 50/50 with the Buyers, so long as Vermont law recognizes HQP hydroelectricity as renewable. Second, should a Vermont Buyer choose to make a sale at resale of the environmental attributes that it has purchased under this PPA, the revenue generated by that sale will be shared 50/50 with HQUS.

4.5. PPA Pricing

Q21. Please describe the essential pricing terms.

A21. The November 2012 PPA starting price is largely based on forward prices and will be fully established later this year. Given market conditions as observed thus far, the first year contract price is projected to start at approximately $60/MWh.

After the first year, the PPA price is derived by a formula that balances influences from regional electricity prices and the movement in general price levels observed across the U.S. economy, subject to a damping feature that limits percentage of the change from the prior year's contract price. The formula remains the same over the full term of the agreement, so the degree and characteristics of the hedge are known now.

As described in the Petitioners' Motion for Confidential Treatment of Prefiled Evidence, the details of the PPA's pricing provisions are subject to confidentiality limitations under Section 11.15 of the PPA, and are therefore described in more detail in confidential testimony that we will submit under seal upon approval by the Board of confidential treatment. For this same reason, portions of the PPA, Confidential Exhibit Petitioners' Joint-3, have been redacted.

Based upon several simulations of the contract as presented by the individual Buyers' witnesses, we expect the resulting contract price to stay near the middle of the expected range of market prices over the term, thereby protecting Vermont consumers from the highest and HQUS from the lowest price swings. The long-term nature of the contract, together with its price smoothing mechanisms, will provide Vermont consumers with important price stability. We submit that the net effect will be a significantly hedged, fair price for clean, renewable power purchased by the Buyers. In fact, in the competitive

RFP process conducted last year by three of the Buyers, we encountered many renewable-based offers, but none performed close to this PPA's combination of price, non-intermittent schedule, volume, credit quality, reliability and term.

Q22. How will the price adjustments be made and who will administer those adjustments?

A22. Section 3.2(e) of the PPA provides that price adjustments will be made annually. The parties have chosen an Operating Committee approach to handle administration of the PPA, including implementation of the annual adjustments to the PPA price (See Section 10.2 of the PPA). The annual adjustments will be implemented as formulaic calculations prescribed by the specific formulas incorporated into the pricing provision of the PPA (Section 3.2(e)). An example price calculation is included in Appendix 3.2(e) of the PPA.

4.6. The Hydro-Québec Guaranty and the Collateral Agreements

Q23. Please describe the Collateral Agreement.

A23. Each Vermont Buyer has entered into a Collateral Agreement with HQUS in the form included as Confidential Exhibit Petitioners' Joint-4 (redacted in part), to govern the need for and use of performance assurance under transactions between each Buyer and HQUS. Specifically, the agreement establishes a collateral threshold, defines how exposure to the other party will be calculated, and specifies the manner and type of additional

performance assurance that can requested. The additional performance assurance, or collateral, could take the form of a cash deposit or a letter of credit from a qualified institution. The failure of a party to perform any of the obligations in the Collateral Agreement creates an event of default under the PPA and under any other potential future purchases from HQUS.

The Collateral Agreements are an important part of the PPA structure and have a number of beneficial features that distinguish them from typical wholesale credit arrangements and without these features it is likely that some of the Buyers would not be able to participate in the transaction. Paragraph 9(j) of each Collateral Agreement contains a confidentiality provision that obligate the parties to those agreements to maintain the confidentiality of the collateral terms and conditions. More detailed discussion will be provided in our confidential testimony that will be submitted when the Board approves confidential treatment.

Q24. Please describe the Guaranty.

A24. Hydro- Québec has executed a Guaranty in favor of each Vermont Buyer as a "beneficiary" to guarantee the payment obligations of HQUS under the PPA. The guaranty is included as Confidential Exhibit Petitioners' Joint-5 (redacted in part).

Q25. Please describe the how the potential liability of Hydro-Québec under the Guaranty is allocated under the Allocation Agreement, Confidential Exhibit Petitioners' Joint-6.

A25. The Allocation Agreement is a separate agreement among the Buyers that allocates to each Buyer its share of the Guaranty limit. The sublimit allocations are proportional to the anticipated purchases by each Buyer over the term of the PPA. These percentages are subject to adjustment in the event that any Buyers do not receive required regulatory or municipal approvals. In addition, the Buyers have the right to transfer sublimit allocations in bilateral transactions over the term of the PPA, provided that the transferring Buyer gives notice to the other Buyers of the reallocation.

4.7. Option of Buyers to Step-Up if a Buyer Fails to Obtain Required Approvals

Q26. Please explain how Article 2 of the PPA will operate if a Vermont Buyer does not obtain its Required Approvals to perform the PPA?

A26. If a Buyer fails to obtain required regulatory or municipal approvals (a "Removed Buyer"), then the remaining Buyers have the option to assume such Removed Buyer's share subject to additional PSB approval and HQUS's consent relating to credit/collateral requirements. However, there are no reallocations if a Buyer terminates or defaults after the PPA becomes effective.

5. Section 248(a) – The General Good of the State

Q27. Section 248(a) provides that no company may purchase electric capacity or energy from outside of the state, for a period exceeding five years, unless the Public Service Board finds that the purchase will promote the general good of the state. How will the electricity purchases under the PPA promote the general good of the state?

A27. Section 8001(a)(3) of Title 30 states that "it is in the interest of the people of the state" to promote state energy policy by, among other things, "providing an incentive for the state's retail electricity providers to enter into affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuation for Vermonters." The energy policy goals articulated in Section 8001(a)(3) are principally focused on the economic features of power supply commitments (duration, stability, affordability, protection from market price volatility).

As we have already explained above, the PPA's pricing structure captures the advantage of trending in part with sustained, but not short-term spot market, price movement. It will provide Vermont ratepayers the chance to benefit from low, future market-based prices, while at the same time protecting them from the brunt of volatile high spot market prices.

In addition, this PPA is consistent with several other important energy policy goals established by the state which were presumably developed to reflect what lawmakers and policymakers consider in the best interests of the state. In 2007, the General Assembly issued legislative findings under Act 92, concluding among other things that: "(1) Global climate change, which is threatening our environment and perhaps ultimately our existence, has been caused in part by an energy policy that is largely dependent upon the burning of fossil fuels"; and "(2) [i]n order to reduce greenhouse gas emissions and environmental degradation, it is essential that we reduce or eliminate our dependence on fossil fuels by significantly improving energy efficiency and shifting to benign forms of energy such as wind, sun and water power." In 2006, the General Assembly passed Act No. 168, which established the goal of reducing Vermont's GHG emissions as compared to 1990 baselines by 25% on or before January 1, 2012, and by 50% on or before January 1, 2028.[3] However, according to the Department of Public Service's ("DPS") CEP, these legislative goals will "fail by a considerable margin" if the Vermont Yankee and VJO Contracts are not replaced by similar, low-carbon resources.[4] We agree. Fossil-fuel resources represent the substantial majority of the power-supply mix in both the New England and New York markets.[5] Three-quarters of generation additions planned in New

3 *See* An Act Relating to Establishing Greenhouse Gas Reduction Goals and a Plan for Meeting Those Goals, 2006 Vt. Acts & Resolves No. 168 (codified as amended at 10 V.S.A. § 578).
4 CEP at III-64.
5 About 40% of both energy and capacity in the New England region is from natural-gas generators. *Id.* at IV-106.

England are for natural gas or combined-natural-gas and oil units.[6] Although initiatives are beginning to be put in place to increase renewable generation in Vermont and the region, the supply of new renewable power is limited relative to total energy needs and renewable portfolio standard requirements and it would be challenging, or alternatively prohibitively expensive, for Vermont to independently develop renewable and low emission resources to replace the supply gap created by the expiration of Vermont's existing Vermont Yankee and VJO Contracts.

The PPA includes the transfer of environmental attributes associated with a sustainable, renewable, low-carbon resource. HQP energy will help Vermont maintain one of the most environmentally benign (from the standpoint of carbon emissions) portfolios in the Northeast.

6. <u>Section 248(b)(2) – Need</u>

Q28. Section 248(b)(2) requires the Board to find that this PPA is required to meet the need for future demand for service which could not otherwise be provided in a more cost effective manner through energy conservation programs and measures and energy efficiency and load management measures. Please explain how this PPA satisfies this criterion.

A28. As described in the testimony and exhibits of each Buyer, Vermont's utilities are facing a significant power supply gap, largely due to the expiration of Vermont's two largest

6 CEP at IV-106.

power resources (the VJO and Vermont Yankee Contracts). The PPA replaces only about 30% of these expiring contracts. This leaves an enormous power supply gap that must be filled with other resources. Vermont's Energy Efficiency Utility ("EEU"), under the PSB's & DPS' supervision, is responsible for state-wide energy efficiency services and we understand that the PSB's budget setting process for the EEU intends to capture the maximum amount of DSM available subject to other statutory considerations. The Buyers (other than BED) no longer have area-wide budgets and DSM expertise. We rely on the EEU's (and BED's) projection of DSM effects in constructing the forecasts of load that in part determine need. In effect we secure supply for the demand that is left knowing that cost effective energy efficiency is included.

As detailed in the need testimonies of each of the other witnesses, current forecasts result in energy efficiency and load response measures holding consumer demand to roughly current levels. The bottom line is that this leaves the very large gap of replacing the energy provided by the expiring Vermont Yankee and VJO Contracts.

7. Sections 248(b)(3) & 248(b)(10) – Stability/Reliability & Existing Transmission Facilities

Q29. Section 248(b)(3) requires the Board to find that this PPA will not adversely affect system stability and reliability. In addition Section 248(b)(10) requires a finding that the PPA can be served economically by existing or planned transmission facilities without

undue adverse effect on Vermont utilities or customers. Please explain how these criteria are met.

A29. As we have already noted, unlike the current VJO Contract, the energy to be provided under the PPA is not linked to specified interconnection facilities or interties, and therefore this PPA will have no direct impact upon stability or reliability of the system or require new transmission investment. This absence of a direct effect is a reflection of the structure of the wholesale market and the functions of its participants. Responsibilities for system reliability and security have been unbundled just as power supply and transmission services were unbundled. In the New England power markets, the ISO has the responsibility for the design and operation of a robust grid to meet the New England load requirements. One benefit of this unbundling is that HQUS will have a firm obligation to provide the PPA energy quantities to the node in Vermont or bear replacement cost in the real time market and this obligation is not excused by unavailability of any specific facilities**.**

Recognizing that the PPA will not directly affect network reliability, we do however expect that the PPA will indirectly lead to beneficial transmission network effects. For example, the PPA creates the incentive for HQ to hedge the economic exposure it has at the Highgate node with a physical flow over the Highgate tie during the contract hours. For those hours that Highgate is unavailable, the PPA creates an incentive for HQ to flow

energy over other ties to hedge (with potential "basis" differences) its exposure at the Highgate node. Furthermore, the parties are committed to supporting the actions necessary by the service providers to maintain Highgate's reliability and make the New England and Québec portions of the Highgate tie capable of carrying 225 MW, because as Buyers and Seller, each side wishes to achieve the higher PPA volumes associated with reaching that goal. The Highgate Joint Owners ("HJO"), which include CVPS and GMP, are currently working with VELCO, Highgate's operational manager, to recondition the facility so that it will perform physically over the next decades as it has in the past. Highgate's cost is treated like Pool Transmission Facilities ("PTF") in the region-wide transmission tariff and the HJO and VELCO will work through ISO-NE's committee processes to plan, gain approval of and regionally recover the cost of reinvestment in Highgate.

Q30. The PPA refers to the Highgate node as the "Sales Point" under the PPA. Doesn't that mean that contract deliveries will flow over the Highgate Converter?

A30. No, not literally. There are no required delivery flows associated with the IBT product. As we stated earlier, Highgate is the node internal to the New England market that the parties have selected for purposes of transacting and calculating energy prices under the PPA. It is not a specified physical delivery point requiring a flow because this PPA utilizes an Internal Bilateral Transaction to effectuate the purchase and sale of energy.

However, as we just explained, as an indirect result of the incentives established by the contract, we do expect that Highgate will continue to be utilized as it is now for delivery of HQP power into New England. The economics are such that HQ is incentivized to utilize a physical flow over Highgate during the hours that it is in service so that HQUS has a physical hedge against its economic exposure to its hourly IBT obligations. HQP holds the exclusive long-term firm transmission reservation to this tie on the Québec side of the system and is building a great excess of power supply, up to twenty times this purchase over the next decade. (Under the Regional Transmission Organization structure, there are no long term reservations on the U.S. side of the tie.) In other words, HQP has the firm right to schedule the flow from HQT-side of the Highgate tie, has a vast quantity of surplus energy and has the economic motivation to hedge its affiliate's economic exposure at the Highgate node. The on-peak power flows scheduled by the VJO and HQ across Highgate have resulted in Highgate serving as a key network reliability resource to the regional grid and Vermont. With the incentives established by this PPA, we expect that Highgate's utilization by HQP and HQUS will be similarly intensive. Highgate should continue to serve as a key network resource in the future as we transition in steps from the expiring VJO Contract.

Based upon HQ's published plans, it is also clear that it views New England as a desirable market for its rapidly expanding export business. This affinity is further

evidenced by HQ's publicized efforts to contract with a group of New England Transmission Owners for the construction of a new $1 billion DC line with a capacity of 1200 MW. It is expected that HQ will "participant fund" or pay for this facility for forty years. This effort supports the expectation that HQ will continue to intensively flow power over Highgate which, at the margin, it does not have to pay for.

8. <u>Section 248(b)(4) – Economic Benefit</u>

Q31. Section 248(b)(4) requires the Board to find that this PPA will result in an economic benefit to the state and its residents. Please explain how this criterion is satisfied.

A31. As we have already noted, Section 8001(a)(3) of Title 30 identifies the following as favorable economic attributes of energy contracts or projects: "affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuation for Vermonters." This PPA satisfies each of these important attributes. It is a very cost effective source of electricity for Vermont customers, as demonstrated by the economic analysis set forth in each Buyer's testimony and exhibits.

In addition, although environmental attributes reflecting HQP System Mix are not currently traded within New England and do not currently qualify for any New England REC program, based on how much the market for attributes has changed over the last twenty-five years, there is a reasonable likelihood that attributes with characteristics

similar to the PPA will become tradable and qualify for REC programs in the long future that this PPA covers. The PPA provides a strong platform to permit value to be achieved from resale of the PPA attributes, by employing two principles that are likely to assure that the PPA attributes will provide the maximum available value irrespective of the verification or trading regimes that may be effective over the PPA term. First, the PPA requires HQUS to verify characteristics of the attributes, which is likely to be an essential element under any future system. The requirement includes verification that: (1) the HQP System Mix must consist of at least 90% hydro in each year, (2) the required amount of attributes originated from the HQP System Mix and were delivered into New England, were transferred to the Buyers, were not transferred to any other person, were not claimed as part of energy sold elsewhere, and were not retired or used in any other program, and (3) HQUS owned the attributes prior to transfer and transferred them to the Buyers free of any competing interests. Second, the PPA distinguishes between the attributes, which reflect the substantiation of the HQP System Mix and are transferred to the Buyers, and certificates or tags associated with the attributes, which reflect the documentation necessary to transfer attributes in a tradable system. This distinction is necessary to assure that the PPA environmental attributes product is not so closely associated with the current system of New England tags that it becomes obsolete if the current system changes.

9. Section 248(b)(7) – Compliance with State Energy Plan

Q32. Please explain how the PPA complies with Vermont's State Energy Plan.

A32. The Plan speaks to the concern over the potential loss of existing power resources, and the need to diversify the Vermont power portfolio with a more sustainable, and stable long-term supply mix, one that is diversified away from large fossil fuel sources. (Plan at v, 1-5) The Draft Update to the 2005 Vermont Electric Plan (the "Plan Update") notes this same major challenge: "No issue in Vermont seems to loom larger in the present energy planning environment than the approaching gap between committed electricity supply and expected demand."

Moreover, the Plan discusses the necessity of looking at the long-term benefits derived from renewable energy and not just the short-term costs. Chapter 5 of the Plan speaks to the importance of a sustainable resource portfolio in Vermont. Because of the characteristics of the HQP system and the contractual commitment to transfer the system's environmental attributes to the Buyers, this resource is highly sustainable. The PPA is consistent with the priorities for the future emphasized in Section 10 of the electric energy plan approved by the DPS under Section 202 (*i.e.* the DPS 2005 Vermont Electric Plan), namely increasing resource diversity and promoting stable-priced and competitively priced resource. It will serve as a hedge against potential high electricity market outcomes (driven, for example, by fossil fuel price increases and/or national

emission reduction requirements). The individual company witnesses will further describe this hedging value for their respective portfolios.

10. Rate Recovery

Q33. The Petition asks the Board to issue a ruling that the PPA costs should be entitled to rate recovery. Why is a rate determination appropriate to make now?

A33. First, we note that the Board has articulated its ability to conduct both prudence and used and useful reviews in the context of a Section 248 proceeding: "Nothing [in 30 V.S.A. § 225-227] or in other provisions of Vermont law, limits the Board's authority to decide, outside of a rate proceeding, whether specific expenditures or investments meet the criteria of Section 218(a) and thus, may be recovered in rates." *Re Vermont Yankee Nuclear Power Corporation*, Docket No. 6545, Order of 6/13/2002, at 96 (hereinafter "*Vermont Yankee*"). The Board also noted in *Vermont Yankee* that its statutory authority would permit it "to make such a determination in the appropriate situation even thought the rate effects would only occur later" provided that a strong showing is made for "clear and compelling benefits to ratepayers that would not be attainable without such recovery guarantees." *See Vermont Yankee*, at 95, 97. The Board also cautioned that any such rate recovery assurance would not apply as to a party's ongoing *management* of its rights and responsibilities under a proposed transaction.

We understand that with any prudence or rate recovery determination, the Board's ruling is going to be limited to the facts that are presented in the record before the time of the decision, and from a practical perspective, it would not be possible to ensure rulings related to future performance by management. The Buyers are not seeking to have the Board issue rulings related to the obligations of the Buyers to prudently manage their respective rights and obligations under the PPA. The management role is, however, limited under this PPA and one that is primarily administrative. That is, the PPA price will be fixed by the formulae for the annual price adjustments. The volumes of the energy and environmental attributes are also determined. The Buyers will have an ongoing responsibility to schedule energy purchases through the ISO-NE scheduling and settlement process, although this is largely a mechanical process that utility power marketers engage in regularly. Because the IBT product does not require physical deliveries, the Buyers are not tasked with managing interconnection issues for deliveries.

The annual price adjustment is also largely mechanical in nature, as the contract's pricing provisions specify the algorithms and data points to be utilized to perform the calculations. The degree of the hedge against spot market price volatility is known now and will not change. Therefore, management discretion over future performance is very limited and the nature of the deal relative to the potential range of future evolving market conditions is known now.

The only thing that is not known and cannot be known with certainty today, is what market conditions will prevail over the term. Petitioners have absolutely no control over market prices. On the other hand, due to the market following features of the PPA price formula, the market data provided by the companies shows that the price should stay near the middle of the expected range of future market prices. We are asking the Board to either find now that this price hedge and its associated environmental attributes is or will be economically useful and recoverable, or to direct us toward other types of resources.

We also believe that there are numerous compelling benefits to our consumers and the state that justify rate recovery of the Buyers' PPA costs. First, rate recovery assurance will permit the Buyers to receive much more favorable credit terms than would otherwise apply without such rate assurance. We discuss details of this in our confidential testimony.

In addition, a finding in this proceeding that the Buyers' expenditures under this PPA meet the criteria of Section 218(a), and thus may be recovered in rates, will also send a very strong signal to the credit rating agencies that supports a conclusion that the companies themselves are more likely to remain creditworthy. This can meaningfully lower costs for our customers to the extent this determination becomes a feature of the approval of long term agreements as it will have a direct bearing upon and has the

potential to improve our credit ratings. How rating agencies evaluate our credit ratings directly affects the cost of all borrowing and indebtedness, as well as other matters such as collateral credit thresholds with many trading parties. Improved credit ratings will lower collateral requirements and cash outlays under this and other financial agreements and instruments, which are tied to creditworthiness.

The Board need not abandon its traditional ratemaking methodologies to reach this finding. Rather, we believe that the facts here clearly support application of standard ratemaking methodologies to find that the PPA represents a prudent and economically useful hedge against uncertain future market price conditions, and that the expenditures required of the Buyers under the PPA are just and reasonable and should be afforded rate recovery in order to ensure the Buyers access to favorable credit terms and to improve their financial positions.

Q34. Please address why the PPA is a prudent power supply addition for the Buyers.

A34. The PPA has been very carefully developed to incorporate attributes that are compatible with and promote not only state energy policy, but guidance from this Board from prior power purchase transactions. We have already addressed numerous energy policy attributes that this PPA satisfies (long-term, favorable to market, stably priced, renewable, low-carbon emissions). In addition, we also note that Section 8001(a)(3) of

Title 30 states that "it is in the interest of the people of the state" to promote state energy policy by, among other things, "*providing an incentive for the state's retail electricity providers to enter into affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuation for Vermonters*." Rate recovery assurance from this Board would create significant incentives for Vermont utilities to enter into contracts that meet statutory objectives, the extent of the price hedge is known now and for all of the reasons already articulated, we believe it is also clear that this PPA fully satisfies these objectives. An order accompanying approval of this HQUS PPA that allows the Buyers to recover the PPA costs in rates over the term of the PPA would provide a very meaningful incentive to the state's electricity providers to undertake long term contracts that are in the best interests of the state.

Q35. Will the Buyers' costs associated with the PPA be used and economically useful?

A35. Yes. There is no question that as long as the Buyers are obligated to supply and are the exclusive providers (barring additional significant public policy initiatives), this power supply is needed and therefore will be used to meet a looming significant shortfall in power supply facing Vermont due to the expiration of the VJO and Vermont Yankee Contracts. This PPA will replace only approximately 30% of the power supply that will be lost when these contracts expire.

The energy and associated environmental attributes will also be economically useful. As noted in *Vermont Yankee*, in evaluating the economic usefulness of power purchase decisions, this Board has "generally compared the value of the payments for the purchase [of power under a PPA] to the value of market-based alternatives." *Vermont Yankee*, Docket 6545, Order of 6/13/2002, at 102. PPA payments will trend with the market. We ask the Board to determine in its review whether or not this contract is a prudent and economically useful hedge. Simulations of the contract's price presented by the individual company witnesses show that while the PPA is an attractive portfolio addition from the perspective of price, it will <u>not</u> be at or below market prices under <u>all</u> market conditions. In fact, under a future of persistently low market prices, a possibility that we cannot rule out, this contract's price will prove to be somewhat above market prices. It will, however, provide Vermont ratepayers some benefit from low future market-based prices (compared to a fixed price contract) by adjusting toward the market price, while continuing to shield them from the effects of potential upward market price volatility. As a general matter, we expect that there is a favorable price effect for the Buyers from the asymmetric risk of high market prices relative to lower market prices given the moderating tendencies of the price formula and because there is more potential for exposure above $60 /MWh than there is below. The

tendency of the contract's pricing formula, which in effect greatly muffles spot price volatility and delays the transition to sustained market price moves, is to give the expected value benefit of this asymmetry to the Buyers.

This contract is also quite unique in that there are no other renewable resource supplies with as attractive a combination of desirable characteristics available to us in the market. In the competitive RFP process conducted last year by three of the Buyers, we encountered many renewable based offers but none performed close to this PPA's combination of price, non-intermittent schedule, volume, credit quality, reliability and term.

Q36. Does this complete your testimony?

A36. Yes.